Policies to Support Open Data Marketplaces

Data Sharing in IoT Ecosystems, Data-supported Services Concepts & Best Practices

29 January 2020, The Hague

Crowne Plaza The Hague Promenade

Van Stolkweg 1, 2585 JL The Hague

Co-organised and supported by the Alliance for Internet of Things Innovation (AIOTI)

Workshop Report

1. Introduction

1.1 Purpose and target group

The workshop on "Policies to Support Open Data Marketplaces" is part of the workshop series provided falling under WP05 on "IoT Policy Framework - Trusted, Safe and Legal Environment for IoT" under task T05.02 (Data in the context of IoT applications). It addresses Data sharing in IoT ecosystems, Data-supported Services Concepts and Best Practices.

Based on the use cases from the IoT Large Scale Pilots (LSPs), the workshop aimed at tackling opportunities for data-driven services in diverse sectors including mobility, automotive, farming and energy.

Expectations from the workshop were to extract key elements of a striving data economy in the relevant sectors to present the underlying architecture design and standards to be set for fair level playing field whilst supporting business models.

Discussions were focused on the challenges for IoT data value chain with a special attention to build consensus among stakeholders on principles of data sharing, possibly paving the way for the establishment of a code of conduct applicable across all sectors. Regulatory issues were also addressed around the necessity to harmonize at European level given the existence of national initiatives.

The event was built for an open attendance with companies of all sizes and with representatives from both private and public sector. As part of the workshop, the organizers aimed at gathering insights from the participants, through round table discussions involving everybody based on the "World Café" method. This technique is a format for hosting dialogues and allows delegates to contribute and deep dive into discussion directly. Each table addressed a topic (see topics in appendix 5.2 Topics for the World Café sessions) related to data marketplaces, was moderated and then was reported to the whole audience.

63 participants were registered for the workshop. Representatives of the Commission from DG Connect, representatives of the LSPs, representatives of SMEs, researchers of other institutions and research projects attended the one-day event. Should be noted that the workshop took place the following day back to back to the Data Sharing Days (27-28 January 2020).

The presentations are publicly available : https://european-iot-pilots.eu/policies-to-support-open-data-marketplaces-event-hague-presentations/.

2. Setting the scene

2.1 Introduction

Rolf Riemenschneider from DG Connect and AL offered an introduction reminding the stakes around data in Europe to set the scene for the workshop in line with the vision of the European Commission. Indeed, they reminded President Ursula von der Leyen's mission to enhance Europe's technological sovereignty, who has entrusted the Commissioner for Internal Market and Services, Thierry Breton, to lead a new "digital strategy" that will enable organizations to share and pool data securely.

They also highlighted the necessity of developing a suitable strategy that will allow the EU to capture the full benefits of data that will help its digital economy to grow and become more productive.

They also reminded how important is the safeguarding of Europe' technological sovereignty as instrumental to enable an IoT data economy, shaping European industrial policies to avoid "The Winner takes it All", setting the standards for fair level playing field, by, enabling consumers and businesses to exercise control over their data assets without having to keep the data in silos.

Investing in data sharing and data-usage tools technologies is as important as investing in blockchain, hyper-performance computing, algorithms, 5G standards but also in AI. Digital Europe Programme plans to invest 2.5 billion EUR in AI but "AI is nothing without data".

Among the orientations for an industrial data strategy is a unified approach for a multi-layer data framework that needs to be determined in a holistic approach and that is common across the value chain as well as across sectors.
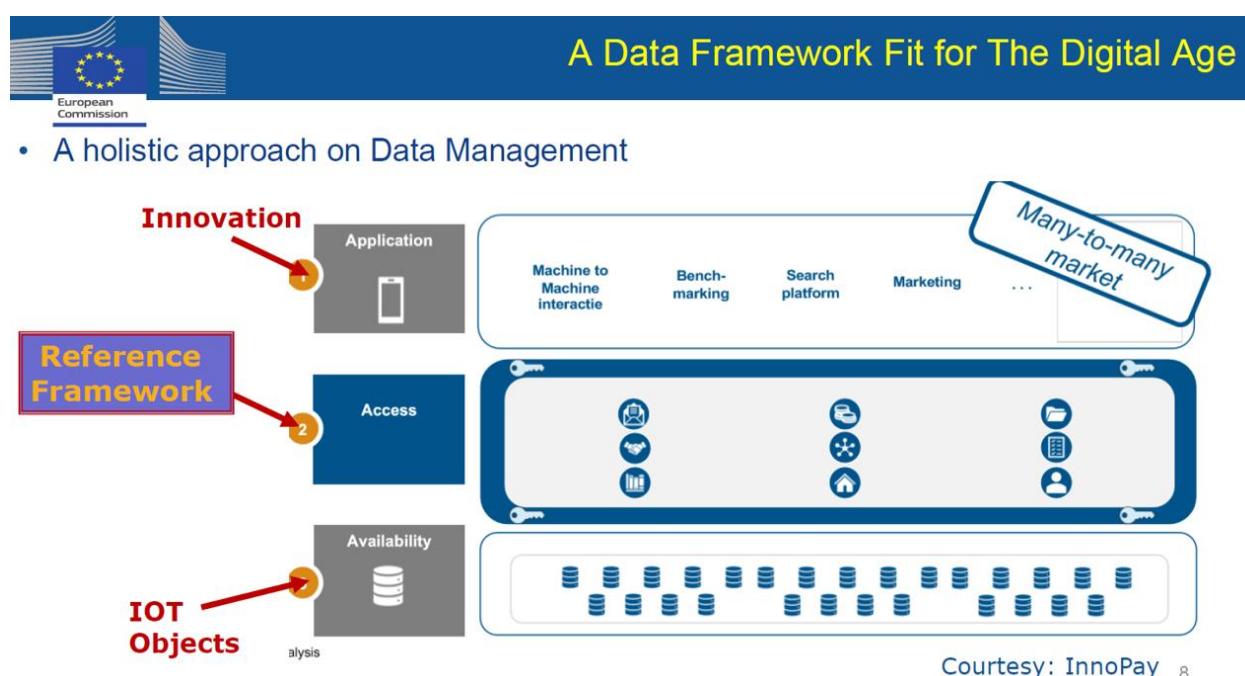

Figure 1: A holistic approach on data management

Still setting the scene, Arthur Legal has emphasized the key role of a data strategy as a common denominator of all key technologies and above all the ability to access and exploit them, within the

boundaries set by the applicable laws and regulations. He also reminded how every type of data needs to be addressed differently in accordance with the seven phases of data life cycle presented.

Figure 2: Top five excuses for data sharing blocking

As for introduction, a representative from AIOTI pointed out the role of data as part of the Green Deal objective. The objectives of the green deal could only be achieved if data is shared across the sectoral boundaries.

Architecture, interoperability, regulations are all required in order to reach the target of climate change with a systemic transformation approach across key industrial sectors: energy, transport, home and living.

Figure 3: Green deal – Climate neutral Europe

The introduction session ended with Innopay representative introducing the 3-layer architecture model to address data sharing issue, also highlighting the significant fragmentation in the IoT domain with diverse platforms and standards, which in fact faces issues related to interoperability (of data) as well as hinder a common approach towards data management. It was stressed that more focus is needed on the 'accessibility layer'. Also, the need for 'data sovereignty' was stressed: enabling people and organisations alike to govern their data, deciding who has access to what data under what conditions (consent management). Innopay representative introduced the principle of trust schemes. A trust scheme (or 'afsprakenstelsel') for data sharing is a coherent set of business, functional, technical operational and legal agreements, that enable organisations adhering to the scheme to share data in a seamless way. A trust scheme ensures a trusted commonly accepted minimal baseline, that

garantuees a certain harmonisation -in the collaborative space- on top of which competitive propositions can be built. A reference model has been created that is composed of 9 building blocks along the lines of which agreements can be made to effectively share data. Creating a 'soft infrastructure' that way, enabling access to data in an 'any-to-any' way (any application can access any data), with data sovereignty as a design principle will help seamless data sharing and unleash the true potential of the data economy.

An application of trust scheme iSHARE in logistics sector was also presented.
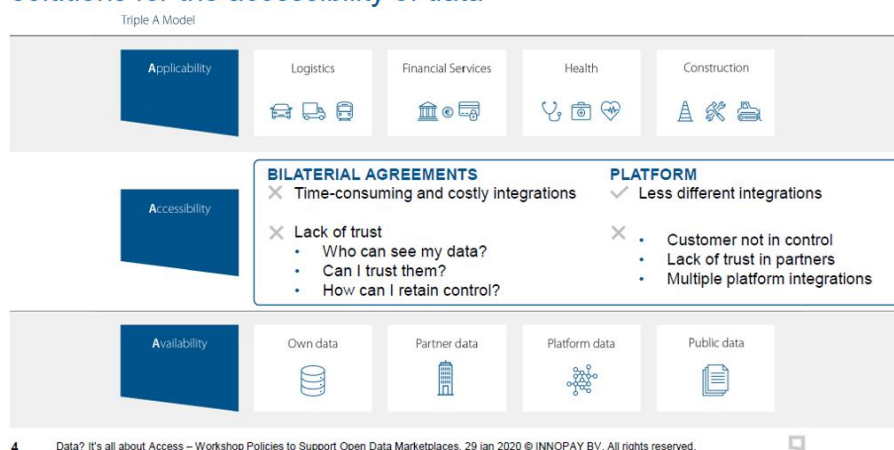
Figure 4: Triple A model – Applicability, Accessibility, and Availability

Figure 5: The nine building blocks of Accessibility

The following sections will provide with highlights from the four sessions of the workshop:
- Market views on data sharing and data-driven services from different sectors.
- Elements of a data framework.
- What needs for smart policy making.
- Experiences and best practices.

2.2 Market views on data sharing and data-driven services from different sectors

AIOTI representative moderated this session. He introduced the session pointing out how important is data interoperability and availability in IoT world, how they need to be solved in order to be able to scale up. Issued by AIOTI, a high-level architecture model has been introduced in a white paper, which unlocks the true value of IoT-enabled Data Marketplaces.

IoT Marketplaces have evolved from growth in countless connected sensors, devices, systems, applications and platforms and success of platforms depends on how efficient the data generated can be securely accessed and integrated with a service. IoT marketplaces are largely driven by the pace of

adopting data-driven services, which leverage data generated from different sources supported by open and dynamic ecosystem behind it. These open networks encourage and drive both innovation for the IoT market and proliferation of a data economy. This track was focused on commercially viable use cases in sectors addressed by LSPs programme.

Georg Rute from Elering in Estonia discussed the issue of data access in energy sector. The energy system is becoming increasingly decentralised, interactive and increasingly incorporates different industrial sectors. For grid operators like Elering, it is essential to get access to energy consumption and generation data to balance the grid. Likewise, other operators, the concept of a data hub is considered as an urgent need. As regards to requirements for the design of platforms, he agreed with the use of open source for data marketplace like Innopay. The launch of an European Energy Data Access Alliance was announced. Georg also outlined that energy is the appropriate sector to implement policies thanks to its ability to scale fast.

In addition, from the energy sector, Peter Hermans from Stedin in Netherlands highlighted that the role of a distribution operator is evolving beyond grid operation towards system integration. This implies a holistic system approach for the local grid and connected devices and systems, e.g. electrical vehicles, smart homes or appliances. He emphasized that digital economic models should be the driver for data sharing to reach a trust scheme model for energy that is built on agreements by European stakeholders. He also discussed about the need to exchange data across sectors like transport finance and public service. Already using Innopay concept, he supported the 9 building blocks model as reference across Europe that can be used to set agreements based on trust between all parties.

Figure 6: Exchange of decentral data based on central framework

Jakob Greiner from Deutsche Telekom in Germany discussed about their "data intelligence hub" which is a data marketplace unlocking data-driven innovation. The decentralized system is based on a data catalogue using both open and commercial data. Virtual workspaces have been created as challenge remaining to make the companies exchanging across diverse sectors. The conceptual approach is fully based on exploiting the open components as defined by the Internation Data Space. As such it is claimed to achieve full transparency for data providers and data services. Jakob

also discussed the use case in the manufacturing industry with UMATI meeting data sovereignty and efficient data exchange requirements.

Figure 7: Data intelligence HUB

Ahmed Nasr provided a perspective from mobility sector with HERE platform, a commercial location platform in over 100 million cars of major OEMs. HERE is a leading service provider for navigation maps. The scale up their services a wider, open concept of an open marketplaces for location-based services beyond navigation is presented. The value of the marketplace is provided through open APIs for data providers and an open ecosystem for service providers. The success factors for an open platform design needs are not only technical but also include knowledge on different industrial sectors like entertainment, charging, insurances generating trust for data access and sharing, HERE's marketplace model is presented as the neutral data host model that came up in the mobility sector to ensure the consent management. In this model, customer data is not only collected by the OEM but accessible transparent to the data owners aka drivers.
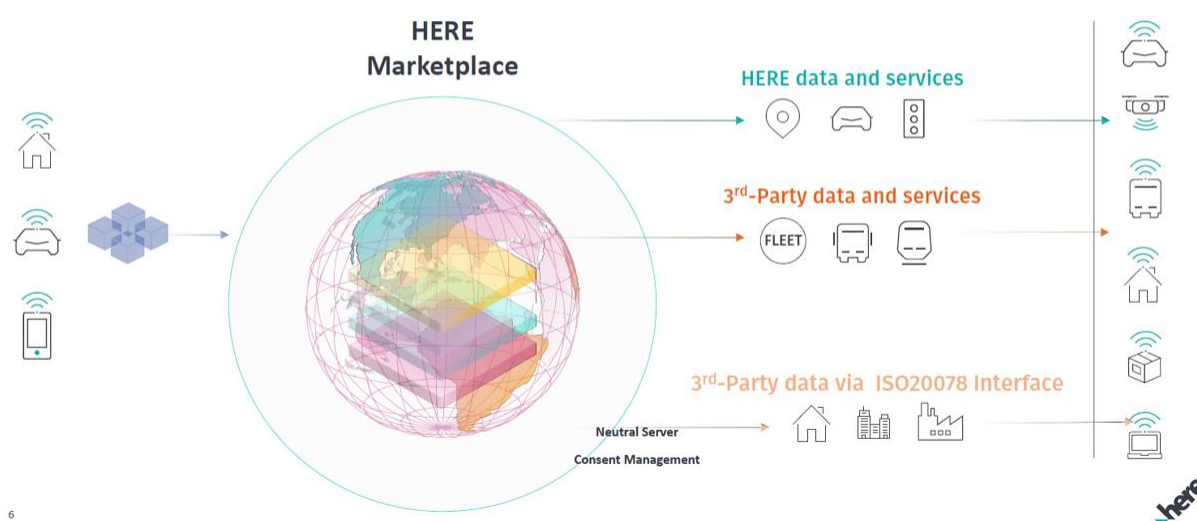

Figure 8: HERE platform

This session has shown Europe strength in designing frameworks and technical components as an enabler for data marketplaces but European data marketplaces striving for growth. There are parallel

but uncoordinated initiatives for building data services in different sectors. Stakeholders expressed the need for a single data economy for Europe. This requires a common view across European players, for this purpose, the Dutch stakeholders announced the initiation of a coalition for Data Sharing to reach an agreement across different sectors like logistics, energy, finance, mobility. The GAIA-X is designed for a federated cloud infrastructure initiated by German authorities with a focus on creating an industrial data economy based on European cloud infrastructure.

In the agriculture sector, it is the OEM cloud as the first access point for data from farming machines. This creates increasing complexity for farmers to deal with data access and interoperability the operation of machine equipment from different vendors. The full potential of farm operation, field and food data can only be exploited services are provided across different platforms. The agriculture sector calls for a high-level architecture which creates a trusted service framework and allowing easy data exchange between platforms and use of multi-vendor data in cloud-service platforms. A federated data platform initiative in the agriculture sector has been initiated by major vendors like John Deere.

In conclusion, those initiatives presented are fragmented within and confined to their vertical approaches, they all have in common to establish a conceptional framework for data sharing , establish standards for data formats, models, semantic interoperability and access and all together have the challenge to scale up and sustain a sizable ecosystem in support of their open marketplace concept. Market success and end user acceptance is fundamental through the emergence of innovative data-services., which add value to data sharing and incentives for data sharing.

2.3 Elements of a data framework

Data exchange between companies is an essential feature of digitisation and industrial transformation and the backbone of a data economy. Data exchange is the baseline for adding value to today's system control and industrial processes. The session addresses the design and concepts of elements of a harmonised data (exchange) framework.

Thorsten Huelsmann from IDSA presented the International Data Space as an open and standardised approach for data access, security and data exchange, turning the cloud infrastructure into a clean room for industrial data storage. Thorsten discussed the approach of peer-to-peer network in manufacturing sector (not a platform) providing usage control of data and ensuing data sovereignty. As regards to reference architecture design, data spaces need to consider governance and usage constraints with the support of smart data infrastructure managing identity management.

Daniel Alonso Roman from ITI BDVA discussed the technical issue with data sharing, needed to be taking into consideration by design (from the data acquisition in the data value chain). Also, bearing in mind the economy of the data is key especially when sharing with citizen, companies, government. For Europe, a key advantage relies on data protection to be compliant with EU values, particularly with trust as key pillar.

Max Schulman from MTK/Copa-Cogeca explains the urgent need for farmers to access data collected on their farms and create knowledge for efficient farm operation. Max makes reference to a Code of Conduct for sharing data between machine builders and farmers in the agriculture sector and explained how the Code of Conduct requires the inclusion of all stakeholders, which contains the lead principles and which create trust among them when exchanging data.

Bram Reijnders from Future of Living presented its perspective based on 5 live projects. Data provided to households is key and can solve the energy consumption and make energy cheaper.

Thomas Basikolo from ITU-T shared the view of an ITU focus group on data management. Harmonization across sectors is required and relevant standard need to be agreed, thus insuring trust framework.

During the Q&A session, Witte Wijsmuller from DG Connect noticed the importance of the location of data processing. Knowing that 40% of data processing will move from the cloud to the edge and that 75% of cloud processing are provided by 5 non-European hyperscalers, Europe needs to invest. Attention should be paid at neutral initiative like GAIA-X.

Alexander Berlin from the farming sector also drawn the attention on the necessity to ensure trust for service providers by opening their code.

This session has highlighted concepts to scale up the measures taken around data marketplaces relying on components frameworks. Component frameworks are designed to tackle many technical barriers that need to be eliminated to obtain easy, trustful, secure and potentially automated data sharing. These frameworks are based on using modular building blocks like IDSA (in manufacturing), iSHARE (in logistics), standard data formats like SENSORIS (for automotive), open components like FIWARE (for smart city) or a data exchange framework like ESFEED (for energy), however, none of them have emerged as a widely adopted standard neither in their vertical domain nor as a potential trans-sectoral concept.

2.4 What needs for smart policy making?

This panel discussion was composed with members from the government of the Netherlands, Finland, Germany and Austria.

Friedrich Gröteke, BMWI, presented the digitalization of public service in Germany. The German government is front-runner with respect to open data with research projects. Also, data strategy will be published soon including open source and, open standards and taken into account Urgent need for action has been expressed for data sovereignty with an ambition to break the monopolies of internet giants like Google, Amazon, Alibaba et al. on cloud platforms. The idea of Gaia-X is to create a federated data infrastructure that makes it possible to securely handle the flow, storage and analytics of industrial data according to predefined rules that reflect European values. In this way, it seeks to contribute to this European goal of ensuring data sovereignty based on the deployment of secured data infrastructures. There is a need for a place where European players from traditional industries like manufacturing, automotive, farming etc. can access, trade and provide commercial services. GAIA-X cloud service has its roots in a generalised abstraction layer for cloud infrastructure through an open definition of a hypervisor – an initiative with technical working groups that was launched in 2020. A key issue remains on identity management binding person and firm.

Lars Meinder, Dutch ministry of Economic Affairs, discussed the limitation of replication in energy sector due to regulation. It is instrumental to integrate sharing of energy data from the meter, which is planned to be included into legislative measures for the sector.

Maria Rautavirta, Finnish Ministry of Transport and Communications discussed about the set of principles for a human-centric, thriving and balanced data economy published through many cross-sector discussions under the Finnish Presidency including the restriction access of open data. Simplification is also a requirement for data sharing (tick box).

Diederik van Leuven, from New Trust Foundation and Dutch ministry of Internal Affairs, discussed the need to rethink the co-creation of open data and the definition of use of open data for upscaling.

The role of public stakeholders especially ministries could be instrumental to triggering a stakeholder dialogue, advancing the agreements on data sharing, setting the right regulatory framework for a sustained, confident investment in data infrastructure. Open access to cloud infrastructure has been a critical point of action but also initiatives to foster a digitisation process across different sectors. The current discussion on data is fuelled by an in-depth discussion on preserving Europe's sovereignty. A dialogue and exchange of digital policy measures across different departments would be a key for success though more important to align and scale national initiatives to a European dimension.

2.5 Experience and best practices from LSPs

The last track was dedicated to lessons to learn from experiences and best practices and was moderated by CREATE-IoT representative and DG CONNECT.

Henrik Madsen from DTU discussed about the flexible energy and water AI and IoT Hub in Denmark. The specific challenge in energy relies on the flexibility requirements that can be brought by digitalization and data intelligence. To accelerate the transition towards green energy data-driven services across different sectors (sector coupling) are instrumental to distribute energy across electricity, heating, water, wastewater, transportation, etc. to match volatile supply to demand. The vision of a trusted data sharing platform will encompass automation and control tools for production and consumption units and grid capacity management.

Laura Daniele and Alena Siarheyeva shared her experiences from Interconnect project in energy sector that may have implications in architecture design. Laura highlighted the different levels of interoperability to be taken into account requiring a common language for the infrastructure. Alena discussed about human-centered used cases with regards to data sharing in the energy sector. From observation in the field, she expressed the paradox attitude end users may have towards data sharing between their privacy concern and their data protection in day-to-day life.

Felix Grolman from Greencom discussed the challenge in energy sector in Germany with the gap between the objective of zero-carbon economy and the need of regulation in data availability. There is a current access restriction to live and granular energy consumption data from intelligent measuring devices required for an adaptable and smart energy system with flexible loads and production. Edge computing could be an option limiting the transmission of required data.

Juanjo Hiero discussed about his FIWARE experience and the need to adhere to open standards and also to open source implementation in the definition of a reference architecture. Leveraging on available open source technology that can be used for data marketplace is key to speed up go-to-market.

Prokop Jehlicka from HERE also outlined the necessity to use edge intelligence in automotive sector, thus considering only data that has changed. He also added the need for harmonized standardization especially for in-vehicle data formats and data access to increase value in data sharing, an area where SENSORIS has made significant progress with an ambition to formalise data models through ISO/IEC.

Gurkan Solmaz from NEC shared his experience from AUTOPILOT LSP for Autonomous Driving supporting smart mobility applications. He discussed the need of open source, standard-based, and interoperable IoT platforms, which in the case of AUTOPOLOT exploits standards from oneM2M and ETSI. Although the approach would nicely complement the data models developed by SENSORIS both initiatives are not linked.

Panos Ilias from ILVO discussed about his experience from DjustConnect platform aiming to facilitate date exchange in the farming sector. He notably addressed the needed conditions to ease the involvement of Flemish farmers in the data economy environment from technical and organizational perspective. The digital identity management is at the heart of data sharing platforms especially when dealing with the farmer consent.
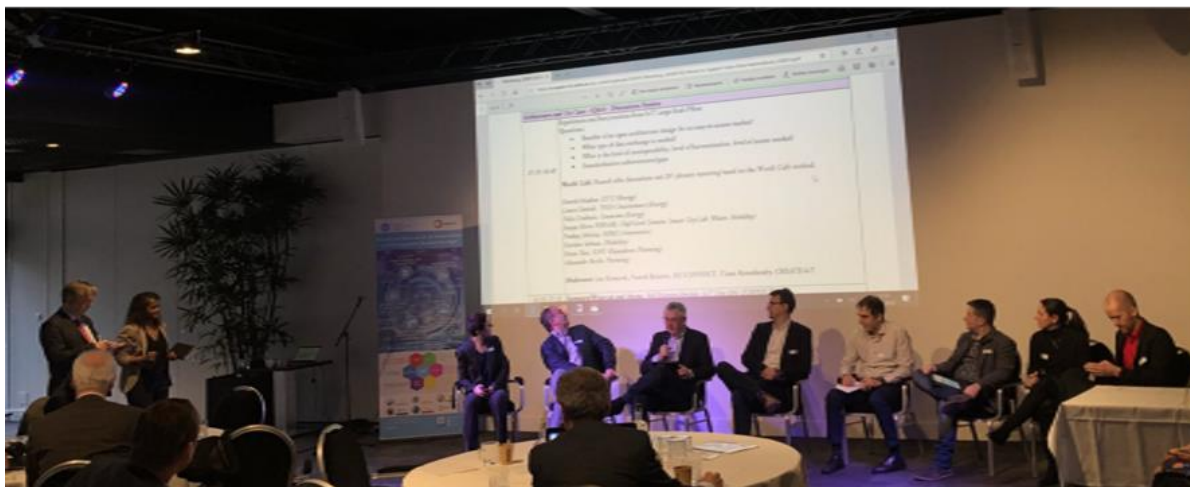

Figure 9: Speakers of the track on experience and best practices from LSPs

3. Conclusions

3.1 Key takeaways

Data-driven innovation is high on the EU's political agenda – that is manifested through the publication of the Commission for a European Strategy for Data.

Clearly, the sharing of industrial data has become an important imperative for the digital transformation of key industrial sectors like automotive, energy, manufacturing, farming etc.

The workshop largely discussed challenges, principles, concepts and essential elements of a data strategy.

Key takeaways and best practices from the sessions and round table discussions have been explored and discussed:

- There are different initiatives in Europe for building a data economy mostly per sector. With the ambition to fast scale up a data marketplace the concept of open interfaces and a neutral data hub is postulated. So far uncoordinated initiatives with a risk of being stuck in a silo, there is a need to have a cross sector reflexion to reach the full potential of digital transformation.

- The creation of generic high-level data architecture is needed to support industrial transformation and new business models. There are key requirements to design Data Sharing: trust, Code of Conduct and data governance schemes. A broad agreement on a conceptional reference data model including generic 9 building blocks are milestones to reach shared views on data management across the value chain but also to seek alignment across vertical sectors.

- Data sovereignty to be considered with attention on neutral initiatives required to promote the wide adoption of the data reference framework and encourage investment in a European data infrastructure. A dialog between relevant industrial stakeholders is required in order to create mutual understanding of potential, risks and implementation barriers of a data economy.

- The regulatory framework for data sharing should be designed to support Commission priorities like the Green Deal and climate neutral that would be achieved only by a cross sector approach. With its data strategy the Commission aims at creating a single market for data through the support of common data spaces, which should encourage businesses to have more data available to innovate.

- For national and European policy makers, smart regulation on B2B data sharing has become a priority, with a profound legal basis that keep companies and individuals who generate data in control and allow innovators, SMEs and newcomers to use the space to innovate..

- Last but not least it is worthwhile to mention that large-scale pilots and platforms that are funded under the Focus Area Digitising and Transforming European Industry under Horizon 2020 in areas like manufacturing, smart farming, data and interoperable grids and healthy living are instrumental to further expand and test the conceptional data frameworks through numerous use cases in the pilot projects, and most import to support the stakeholder dialogue across the different sectors.

Figure 10 : Rolf Riemenschneider wrapping up the day

3.2 Follow-up

Discussions around strategy on data management to be continued:
- Use cases and Innovation Hubs workshop on 20th of February
- AIOTI workshop on architectures and standards on the 21st of February in Brussels
- IoT Week in June 2020 in Dublin

4. References

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[12]   IMF – The Economics and Implications of Data – An Integrated Perspective, 2019. Online at: https://european-iot-pilots.eu/wp-content/uploads/2020/01/TEIDEA.pdf

[13]   European Large-Scale Pilots Programme. Policies to Support Open Data Marketplaces. Online at: https://european-iot-pilots.eu/policies-to-support-open-data-marketplaces-event-hague-presentations/

5. Appendices

Further information is described in related background documents.

5.1 Agenda

European Large-Scale Pilots Programme

Alliance for Internet of Things Innovation

Workshop Program 29 January 2020

Time	
08:30-09:00	Registration
09:00-09:10	Welcome and Introductions, *Rolf Riemenschneider, DG CONNECT, Ovidiu Vermesan AIOTI/CREATE-IoT*
09:10-10:00	*Setting the Scene:* *Rolf Riemenschneider, DG CONNECT* *Arthur van der Wees, AIOTI/CREATE-IoT* *Natalie Samovich, AIOTI/Enercoutim* *Mariane ter Veen, InnoPay*
Market views on data sharing and data-driven services from different sectors – Q&A – Discussions Session	
10:00-11:00	Market views across verticals: Farming, Energy, Mobility, Telecom Questions: • What are the use-cases? • How does this define the design of the marketplace/platform? • What are the products and services? • What are the factors for success / barriers? *Panellists:* *1. Georg Rute, Elering* *2. Jakob Greiner, T-Systems* *3. Peter Hermans, Stedin* *4. Ahmed Nasr, HERE* *Moderators: Mark van Stiphout, DG ENERGY, Omar Elloumi, AIOTI/Nokia*
11:00-11:30	**Coffee/Tea Break**
Elements of a data framework – Q&A – Discussions Session	
11:30-12.15	Questions: • General Principles? A Code of Conduct? • How does this define the design of an open marketplace/platform? • Building blocks and connectors • What is the validation/settlement process? • Challenges of governance • Need of market design and regulation? *Panellists:* *1. Max Schulman, MTK / Copa-Cogeca* *2. Thorsten Huelsmann, IDSA* *3. Daniel Alonso Román, from ITI BDVA* *4. Bram Reijnders, Future of Living* *5. Thomas Basikolo, ITU-T* *Moderators: Franck Boissiere, DG CONNECT & Mariane ter Veen, Innopay*
12.15- 13:00	**World Café:** The panel will be followed by 30' round table discussions and 15' plenary reporting based on the World Café method. *Moderators: Witte Wijsmuller, Franck Boissiere, Rolf Riemenschneider DG CONNECT, Tiana Ramahandry, CREATE-IoT*
13:00-14:00	**Networking Lunch**

	What needs for smart policy making? - Q&A - Discussions Session
14:00-15:00	Questions: • What are challenges for market design? • How to achieve coherence across different policy domains • What measures are planned at national level (if there are) • Need to act at National / European level *Panellists:* *1. Friedrich Gröteke, BMWI, Germany* *2. Lars Meindert, Dutch Ministry of Economic Affairs* *3. Maria Rautavirta, Finnish Ministry of Transport & Communications* *4. Lisbeth Mosnik, BMVIT - Austrian Federal Ministry for Transport, Innovation and Technology* *5. Diederik van Leeuwen, New Trust Foundation* ***Moderators:*** *Rolf Riemenschneider DG CONNECT, Arthur van der Wees AIOTI/CREATE-IoT*
15:00-15:15	**Coffee/Tea Break**
	Architecture and Use Cases - Q&A - Discussions Session
15:15-16:45	Experiences and best practices from IoT Large-Scale Pilots Questions: • Benefits of an open architecture design for an easy-to-access market? • What type of data exchange is needed? • What is the level of interoperability, level of harmonisation, level of access needed? • Standardisation achievements/gaps **World Café:** Round table discussions and 20' plenary reporting based on the World Café method. *Henrik Madsen, DTU (Energy)* *Laura Daniele, TNO / Interconnect (Energy)* *Felix Grolman, Greencom (Energy)* *Juanjo Hiero FIWARE, Olaf-Gerd Gemein, Smart City Lab (Water, Mobility)* *Prokop Jehlicka, HERE (Automotive)* *Gurkan Solmaz, (Mobility)* *Panos Ilias, ILVO Vlaanderen (Farming)* *Alexander Berlin (Farming)* ***Moderators:*** *Jan Komarek, Franck Boissiere, DG CONNECT, Tiana Ramahandry, CREATE-IoT*
16:45-17:15	*Summary/Wrap-up and closing, Rolf Riemenschneider, IoT Unit DG CONNECT*

5.2 Topics for the World café sessions

The organizers want to capture the collective knowledge of everybody attending the Workshop. What are your ideas and solutions for Support of Open Data Marketplaces and related Data Sharing in IoT Ecosystems, Data-supported Services, Concepts & Best Practices? For instance, what instruments – high level, practical, technical, organizational, digital, cyber-physical, guidelines, standards, regulatory, enforcement and the like – are potentially available and feasible and how to organize those in view of digital strategies in the European Union?

Therefore, the panel discussions on (A) Elements of a Data Framework at 11.30, and (B) Architectures & Uses Cases at 15.15 will each be followed by Round Table Discussions to address the question above. There will be moderated round tables running simultaneously using the 'World Café' format. The World Café methodology is a simple, effective, and flexible format for hosting group dialogues, and allows delegates to contribute and deep dive into the discussion directly. Each table will be moderated, and the discussion will be reported. The Chatham House Rule applies.

Round Table topics during 1st World Cafe (Principles, Purpose, Objects & Subjects of Data Frameworks):

1. What principles could be part of a data framework or code of conduct?
2. How to seek trust and agreement on an open architecture design of interoperable data marketplaces/platforms, and what building blocks and contexts are relevant?
3. What challenges of governance of a code of conduct or reference-architecture do you identify, and how to address those, with which stakeholders?
4. How and where can decentralized, distributed, hybrid and multi-layered ecosystems have impact to address societal, technical, organisational, ecological and economical challenges?
5. How to come to digital and data sovereignty, of people, organisations and communities in the EU, in the context of open data marketplaces and IoT other ecosystem?
6. How can accountability facilitate open data marketplaces and IoT other ecosystems – example can LIBRA work and grow in Europe?
7. How could/should policy instruments such as regulation facilitate data sharing and data-driven business models in IoT ecosystems?

Round Table topics during 2nd World Cafe (Use Cases & Best Practices):

1. In energy transition context, which experiences and best practices from IoT Large-Scale Pilots or other IoT projects can you share and structure?
2. In smart city/society context, which experiences and best practices from IoT Large-Scale Pilots or other IoT projects can you share and structure?
3. In smart farming and food context, which experiences and best practices from IoT Large-Scale Pilots or other IoT projects can you share and structure?
4. In smart mobility context, which experiences and best practices from IoT Large-Scale Pilots or other IoT projects can you share and structure?

Which challenges and good practices for standardisation can you identify and structure in related standardisation, and how to address those challenges?